

## AMENDMENTS TO THE CLAIMS

**1. (Currently Amended)** An optical packet exchanger for switching a transmission path for an optical packet which constitutes a burst-type optical signal, said optical packet exchanger comprising:

an optical transmitter section ~~for transmitting~~operable to transmit an optical packet, on which an information signal and an address signal corresponding to a transmission destination for the information signal are superposed by different modulation methods; said optical transmitter section including:

a light source operable to output continuous light; and

an optical modulation section operable to output an optical packet which is obtained by subjecting output light from said light source to an intensity modulation using the information signal and a phase modulation using the address signal, wherein said optical modulation section comprises:

an optical splitter section operable to split the output light from said light source into two light portions;

a first splitter section operable to split the address signal into two address signals;

a second splitter section operable to split the information signal into two information signals;

a phase inversion section operable to invert a phase of one of the information signals output from said second splitter section;

a first synthesis section operable to combine one of the address signals output from said first splitter section with the information signal having a phase that has been inverted by said phase inversion section, to output a first synthesized signal;

a second synthesis section operable to combine the other address signal output from said first splitter section with the other information signal output from said second splitter section, to output a second synthesized signal;

a first waveguide for subjecting one of the light portions output from said optical splitter section to a phase modulation using the first synthesized signal;

a second waveguide for subjecting the other light portion output from said optical splitter section to a phase modulation using the second synthesized signal;

and

an optical synthesis section operable to permit optical synthesis and interference between the optical phase modulated signal output from said first waveguide and the optical phase modulated signal output from said second waveguide to generate the optical packet;

an optical transmission section for propagating an optical packet transmitted from ~~the said~~ optical transmitter section; and

a router section ~~for receiving~~operable to receive the optical packet via ~~the said~~ optical transmission section, and ~~switching~~operable to switch a transmission path for the optical packet based on the address signal which is extracted from the optical packet, wherein said router section comprises:

an optical splitter section operable to split the optical packet received via said optical transmission section into two optical packets;

an address reading section operable to read the address signal based on phase information of one of the optical packets output from said optical splitter section; and

a path switching section having a plurality of output ports and being operable to select, based on the address signal read by said address reading section, one of the plurality of output ports from which to output the other optical packet output from said optical splitter section.

## **2-4. (Cancelled)**

**5. (Currently Amended)** An optical packet exchanger for switching a transmission path for an optical packet which constitutes a burst-type optical signal, said optical packet exchanger comprising:

an optical transmitter section operable to transmit an optical packet on which an

information signal and an address signal corresponding to a transmission destination for the information signal are superposed by different modulation methods. The optical packet exchanger according to claim 1, wherein; the said optical transmitter section includes:

a light source for outputting operable to output continuous light; and

an optical modulation section for outputting operable to output an optical packet which is obtained by subjecting the output light from the said light source to an intensity modulation using the information signal and a phase modulation using the address signal; and

an optical transmission section for propagating an optical packet transmitted from said optical transmitter section; and

a router section operable to receive the optical packet via said optical transmission section, and being operable to switch a transmission path for the optical packet based on the address signal which is extracted from the optical packet, wherein said the router section includes:

an optical splitter section for splitting operable to split the optical packet received via the said optical transmission section into two optical packets;

an address reading section for reading operable to read the address signal based on phase information of one of the optical packets output from the said optical splitter section;

an optical phase adjustment section for adjusting operable to adjust a phase of the other optical packet output from the said optical splitter section to a constant phase value, based on the address signal read by the said address reading section; and

a path switching section having a plurality of output ports and selecting and being operable to select, based on the address signal read by the said address reading section, one of the plurality of output ports from which to output the other optical packet whose having a phase that has been adjusted to the constant phase value by the said optical phase adjustment section.

#### **6-10. (Canceled)**

**11. (Currently Amended)** The optical packet exchanger according to claim 21, wherein; the said address reading section includes:

a phase/intensity conversion section for outputting operable to output an optical signal

which is obtained by converting optical phase variation in one of the optical packets output from ~~the said~~ optical splitter section into optical intensity variation; and

a photoelectric conversion section ~~for converting~~operable to convert the optical signal output from ~~the said~~ phase/intensity conversion section into an address signal.

**12-13. (Canceled)**

**14. (Currently Amended)** The optical packet exchanger according to claim 5, wherein;  
~~the said~~ address reading section includes:

a phase/intensity conversion section ~~for outputting~~operable to output an optical signal which is obtained by converting optical phase variation in one of the optical packets output from ~~the said~~ optical splitter section into optical intensity variation; and

a photoelectric conversion section ~~for converting~~operable to convert the optical signal output from ~~the said~~ phase/intensity conversion section into positive and negative address signals, the negative address signal being obtained by inverting ~~the a~~ polarity of the positive address signal, and ~~outputting~~operable to output the positive address signal to ~~the said~~ path switching section and the negative address signal to ~~the said~~ optical phase adjustment section.

**15-19. (Canceled)**

**20. (Currently Amended)** The optical packet exchanger according to claim 11, wherein;

~~the said~~ photoelectric conversion section ~~converts~~is operable to convert an intensity of the optical signal output from the phase/intensity conversion section to logic value 1 if the intensity is equal to or less than a predetermined threshold value and to logic value 0 if the intensity is greater than the predetermined threshold value, thereby ~~extracting~~being operable to extract the address signal.

**21-22. (Canceled)**

**23. (Currently Amended)** The optical packet exchanger according to claim 20, wherein;  
the threshold value is equal to or greater than a value which is  $1/4$  as large as a difference between an optical intensity of the optical packet input to ~~the~~ said optical splitter section at logic value 1 and an optical intensity of the optical packet at logic value 0, and is equal to or less than a value which is  $1/2$  as large as the optical intensity of the optical packet at logic value 0.

**24-28. (Canceled)**

**29. (Currently Amended)** The optical packet exchanger according to claim 11, wherein;  
~~the~~ said phase/intensity conversion section outputs two optical signals ~~whose~~ having modulated components that are out of phase.

**30-31. (Canceled)**

**32. (Currently Amended)** An optical packet exchanger for switching a transmission path for an optical packet which constitutes a burst-type optical signal, said optical packet exchanger comprising:

an optical transmitter section operable to transmit an optical packet on which an information signal and an address signal corresponding to a transmission destination for the information signal are superposed by different modulation methods. The optical packet exchanger according to claim 1, wherein, the said optical transmitter section includes:

a light source ~~for outputting~~ operable to output continuous light; and

an optical modulation section ~~for outputting~~ operable to output an optical packet which is obtained by subjecting the output light from ~~the~~ said light source to an intensity modulation using the information signal and a phase modulation using the address signal; and

an optical transmission section for propagating an optical packet transmitted from said optical transmitter section; and

a router section operable to receive the optical packet via said optical transmission section, and being operable to switch a transmission path for the optical packet based on the address signal which is extracted from the optical packet, wherein said ~~the~~ router section

includes:

an optical splitter section ~~for splitting~~operable to split the optical packet received via ~~the said~~ optical transmission section into two optical packets;

an address reading section ~~for reading~~operable to read the address signal from intensity information of one of the optical packets output from ~~the said~~ optical splitter section;

an optical intensity adjustment section ~~for adjusting~~operable to adjust an intensity of the other optical packet output from ~~the said~~ optical splitter section to a constant intensity value, based on the address signal read by ~~the said~~ address reading section; and

a path switching section having a plurality of output ports ~~and selecting~~and being operable to select, based on the address signal read by ~~the said~~ address reading section, one of the plurality of output ports from which to output the other optical packet ~~whose having a phase that~~ has been adjusted to the constant intensity value by ~~the said~~ optical phase adjustment section.

**33. (Currently Amended)** A router for switching a transmission path for an optical packet which constitutes a burst-type optical signal and on which an information signal and an address signal corresponding to a transmission destination for the information signal are superposed by different modulation methods, ~~the said~~ router comprising:

an optical splitter section ~~for splitting~~operable to split the optical packet into two optical packets;

an address reading section ~~for reading~~operable to read the address signal based on phase information of one of the optical packets output from ~~the said~~ optical splitter section, said address reading section including:

a phase/intensity conversion section operable to output an optical signal which is obtained by converting optical phase variation in one of the optical packets output from said optical splitter section into optical intensity variation; and

a photoelectric conversion section operable to convert the optical signal output from the phase/intensity conversion section into positive and negative address signals, the negative address signal being obtained by inverting the polarity of the positive address signal, and operable to output the positive address signal to said path switching section and the negative address signal to said optical phase adjustment section; and

a path switching section having a plurality of output ports ~~and selecting~~being operable to select, based on the address signal read by ~~the said~~ address reading section, one of the plurality of output ports from which to output the other optical packet output from ~~the said~~ optical splitter section—; and

an optical phase adjustment section operable to adjust a phase of the other optical packet output from said optical splitter section to a constant phase value based on the address signal read by said address reading section, and thereafter operable to output the other optical packet to said path switching section.

**34. (Cancelled)**

**35. (Currently Amended)** A router for switching a transmission path for an optical packet which constitutes a burst-type optical signal and on which an information signal and an address signal corresponding to a transmission destination for the information signal are superposed by different modulation methods, said router comprising:

an optical splitter section operable to split the optical packet into two optical packets;

an address reading section operable to read the address signal based on phase information of one of the optical packets output from said optical splitter section. ~~The router according to claim 33, wherein, said the~~ address reading section includes:

a phase/intensity conversion section ~~for outputting~~ operable to output an optical signal which is obtained by converting optical phase variation in one of the optical packets output from ~~the said~~ optical splitter section into optical intensity variation; and

a photoelectric conversion section ~~for converting~~ operable to convert the optical signal output from ~~the said~~ phase/intensity conversion section into an address signal; and

a path switching section having a plurality of output ports and being operable to select, based on the address signal read by said address reading section, one of the plurality of output ports from which to output the other optical packet output from said optical splitter section.

**36-37. (Canceled)**

**38. (Currently Amended)** The router according to claim 35, wherein;

~~the said~~ photoelectric conversion section ~~converts~~ is operable to convert an intensity of the optical signal output from ~~the said~~ phase/intensity conversion section to logic value 1 if the intensity is equal to or less than a predetermined threshold value and to logic value 0 if the intensity is greater than the predetermined threshold value, thereby ~~extracting~~ being operable to extract the address signal.

**39-40. (Canceled)**

**41. (Currently Amended)** The router according to claim 38, wherein;

the threshold value is equal to or greater than a value which is  $1/4$  as large as a difference between an optical intensity of the optical packet input to ~~the said~~ optical splitter section at logic value 1 and an optical intensity of the optical packet at logic value 0, and is equal to or less than a value which is  $1/2$  as large as the optical intensity of the optical packet at logic value 0.

**42-46. (Canceled)**

**47. (Currently Amended)** The router according to claim 35, wherein;

~~the said~~ phase/intensity conversion section ~~outputs~~ is operable to output two optical signals whose modulated components are out of phase.

**48. (Cancelled)**